

## APPLYING ASPECTS OF PROBLEM BEHAVIOR THEORY TO LATINO YOUTH: THEORETICAL, METHODOLOGICAL, AND SOCIOCULTURAL CONSIDERATIONS

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### ABSTRACT

Problem Behavior Theory (PBT; Jessor, Donovan, & Costa 1991) is a common and influential perspective designed to further our understanding of problem behaviors among youth. However, few scholars have directly examined the validity of PBT to use with Latino youth. The present chapter critically examines the basic tenets of PBT and its relevance to understanding problem and conventional behavioral outcomes in Latino youth. A brief overview of PBT is presented, followed by an in-depth, critical discussion of its application to research on Latino youth. Several conceptual and methodological recommendations for future research are discussed including definitional issues and relevant social, cultural, and demographic influences (e.g., peer and family influences, socioeconomic status, ethnic identity, immigration and acculturation, and gender) on problem and conventional behaviors. In addition, the links between problem and conventional behaviors are critically investigated. Consideration of these various factors will further enhance the ecological and cultural validity of Latino youth development theories and research.

### INTRODUCTION

Problem behaviors (e.g., substance use, physical fighting, binge drinking, risky sex behaviors) among Latino adolescents has been an ongoing concern for many practitioners and health professionals. While recent statistics indicate slight declines in the prevalence rates of problem behaviors among Latinos during the last several years, the percentage of Latino adolescents who engage in problem behaviors such as physical fighting, cocaine use, substance use (alcohol and marijuana) on school property, and teen pregnancy remain high relative to White adolescents (CDC 2002). Furthermore, Latinos represent one of the largest and fastest growing ethnic minority groups in the U.S. (U.S. Census Bureau 2001a). Hence, issues related to social development and cultural adjustment will become increasingly relevant in research and service delivery with this population. Finally, Latino youth make up an increasing percentage of the U.S. population (U.S. Department of Health and Human Services 2001). Taken together, these statistics highlight the importance of furthering researchers' and health professionals' understanding of problem behaviors in Latino youth.

There have been a number of theories that have been developed and tested that attempt to explain adolescent social behaviors (e.g., Hawkins, Catalano, & Miller 1992). However, there are several limitations in the existing literature on adolescent behaviors that are worth highlighting. First, many theo-

retical models on problem and conventional behaviors were formulated and tested primarily with White, middle-income populations. And second, although a number of culturally-relevant variables have been shown to be associated with risk-taking and social competence behaviors among ethnically diverse youth, many mainstream theories do not account for culturally-relevant variables. In order to enrich our theoretical understanding of problem and conventional behaviors among ethnically diverse youth, it is important that researchers closely examine existing models and arrive at alternative formulations that take into account culturally-relevant methodological and conceptual factors.

The present paper examines Problem Behavior Theory (PBT; Jessor & Jessor 1977; Jessor, Donovan, & Costa 1991) and its relevance to Latino youth. The focus of the present paper is PBT because it is one of the most widely studied conceptual and influential models in adolescent and young adult development. This paper begins with a brief overview of relevant problem behavior research with Latino adolescents. Methodological considerations in the conception of PBT, as well as culturally-relevant factors known to be linked to Latino adolescents' risk-taking behaviors are presented. Finally, implications for theory are discussed.

### OVERVIEW OF PROBLEM BEHAVIOR THEORY

Problem Behavior Theory is a psychosocial model that attempts to explain behav-

ioral outcomes such as substance use, deviancy, and precocious sexual behavior among adolescents (Jessor & Jessor 1977) and young adults (Jessor et al 1991). The model includes two antecedent-background factors, and three independent, but related systems of psychosocial components. Antecedent-background variables consist of demographic factors (e.g., parental education and occupational levels, family structure), and socialization influences that encompass parental ideologies with respect to traditionality, religiosity, tolerance for deviance, home climate, and peer and media influences. The three psychosocial systems consist of personality, perceived environment, and behavior systems, each including variables that contribute to the likelihood that problem behaviors will occur.

The personality system consists of three components. The Motivational-Instigation Structure encompasses an individual's set of values and expectations regarding academic achievement, independence, and level of peer affection. The Personal Belief Structure consists of a person's social criticisms (i.e., the acceptance or rejection of society's norms, values, and practices), level of alienation from others, self-esteem, and internal/external locus of control. The third component of the personality system is the Personal Control Structure, which entails an individual's attitude and tolerance towards deviance, level of religiosity, and positive functions (e.g., drinking reduces stress and anxiety) and perceived effects of risk behaviors.

The perceived environmental system consists of distal and proximal components that reflect social influences. The distal structure is comprised of contextual social factors regarding an individual's level of parental-, familial-, or peer-orientation. In contrast, the variables in the proximal structure encompass approval or disapproval from parents, family, or peers regarding problem behavior(s).

The third component of Problem Behavior Theory, the behavior structure system, consists of problem and conventional behavioral structures that work in opposition to one another. Examples of the problem behavior structure include illicit drug use, tobacco use, alcohol abuse, deviancy, and precocious sexual behavior. Jessor and his colleagues postulate that these problem behaviors stem from an individual's affirma-

tion of independence from parents and societal influence. In contrast, conventional behavior structures consist of behaviors oriented towards society's traditional standards of appropriate conduct such as church attendance and high academic performance. An important premise of PBT is that proneness to specific problem behaviors entails involvement in other problem behaviors and less participation in conventional behaviors (Jessor 1987). This premise is a central tenet of PBT and has important implications for research and intervention. Because of the significance of this claim, the present paper will focus on examining the validity of this tenet, especially when applied to understanding Latino youth.

## CONCEPTUAL ISSUES IN PROBLEM BEHAVIORS

### Definitions and Classifications

According to Jessor, problem behavior is defined as

behavior that departs from the norms—both social and legal—of the larger society; it is behavior that is socially disapproved by the institutions of authority and tends to elicit some form of social control response whether mild reproof, social rejection, or even incarceration. (1987 332)

These behaviors include, but are not limited to, substance use (e.g., tobacco, alcohol, and illicit drugs), general deviant behaviors (e.g., vandalism, stealing), and precocious sexual intercourse.

### PBT and Latinos

Relatively few studies have directly examined the generalizability of PBT in Latino youth. A few studies have examined the relations among problem behaviors and the factor structure posited by PBT in Latino youth. For example, Dinh and colleagues' (2002) study with Latino youth (primarily Mexican American youth) revealed that substance use attitudes, association with delinquent peers, externalizing problem behaviors, and gang involvement loaded on a single-factor which was descriptive of "problem behavior proneness." Furthermore, findings indicated that problem behavior proneness was stable over a one-year time period.

Although prior research has shown evidence for problem behavior proneness

among Latino youth, it has been suggested that the structure of problem behaviors may differ across ethnic groups (Barrera, Biglan, Ary, & Li 2001). Newcomb noted that,

On the basis of the differential association observed between drug use and other types of delinquency or problem behaviors...it seems possible that this syndrome may have different patterns for various ethnic groups. (1995 126)

Indeed, prior research with Latino youth showed marijuana use loaded higher on a second factor with arrest history than on the first factor with alcohol and tobacco use (Ebin, Sneed, Morisky, Rotheram-Borus, Magnusson, & Malotte 2001). Finally, a study with Latino college students showed variations in the number of factor structures in problem and conventional behaviors across Latino subgroups, suggesting that the behavior system may operate differently across these groups (Zamboanga, Carlo, & Raffaelli 2004). On the basis of those and other empirical findings, researchers have raised questions about the generalizability of PBT to other ethnic groups (e.g., Barrera et al 2001; Mitchell & Beals 1997; Newcomb 1995; Williams, Ayers, Abbott, Hawkins, & Catalano 1996).

One area of particular concern is that the operational definition of problem behavior may be too narrow to apply to Latino groups. For example, in their follow-up work with young adults, Jessor and colleagues omitted sexual intercourse from the behavior structure system. They argued that

with development from adolescence to young adulthood, the very same behavior—sexual intercourse—shifts from problem to normative behavior. (1991 24)

However, it should be noted that risky sexual behaviors are problematic, particularly among Latino populations (Raffaelli, Zamboanga, & Carlo 2005). For example, Latinas are more likely to engage in unprotected intercourse than women from other ethnic groups (cf. Raffaelli et al 2005). Furthermore, sexually active Latina college students are less likely to use condoms than their female counterparts from other ethnic groups (CDC 1997). Although there might be many reasons that account for frequent unsafe sexual behaviors among Latinas, careful consider-

ation of the definition of risky-sexual behaviors in this population is imperative. Taken together, it is important to consider the definition of problem and normative behaviors in the appropriate ethnic and developmental contexts.

Another variable in the behavior structure system of PBT worth noting is general deviant behaviors. According to Jessor and colleagues (1977, 1991), general deviant behaviors are behaviors that violate social and legal norms but do not involve substance use and misuse. Jessor and Jessor (1977) measured general deviance by using a multi-item scale that assessed diverse problem behaviors such as trespassing, vandalism, lying, stealing, threatening a teacher, and skipping school without a valid excuse. Jessor and colleagues (1991) used similar items (except skipping school and threatening a teacher) and added initiating fights to measure general deviant behaviors in young adults. Such conception of general deviant behavior is consistent with a "syndrome" view of problem behaviors; however given the paucity of research on the structure of problem behaviors in Latino adolescents and young adults, it remains unclear whether this purported structure of general deviancy has functional and structural equivalence with this population.

#### **PROBLEM BEHAVIORS IN LATINOS: SOCIAL CONSIDERATIONS**

Jessor and colleagues (1991) acknowledged the limited attention given to "distal" factors (i.e., social environment) in their early formulation of PBT. They noted that such

decision was partly influenced by the logic of causality and partly by the relative homogeneity of social background of our in-school, relatively middle-class population of youth. (1991 19)

Although Jessor and colleagues (1991) included a number of demographic variables (e.g., education, occupation, religious affiliation, and family structure) in their PBT model, there are several cultural and sociodemographic factors that are also relevant in our understanding of problem behaviors in Latino youth. The following section provides examples on the relevance of social, cultural, and demographic factors to problem behaviors such as substance use in Latino youth.

### Peer Influences

Researchers have argued that one of the strongest influences on youth problem behaviors is involvement with delinquent peers (Barrera et al 2001). Consistent with prior studies in non-Latino populations, research with White, Hispanic, and American Indian adolescents revealed that association with delinquent peers was associated with involvement in general problem behaviors (substance use, poor academic performance, and antisocial behavior) (Barrera et al 2001). Research with Latino adolescents revealed strong relations between peer alcohol and peer marijuana use and adolescent drinking and marijuana use, respectively (Frauenglass, Routh, Pantin, & Mason 1997). A large-scale study with African American and Puerto Rican adolescents showed tolerance of deviance and peer modeling of substance use and deviance to be predictive of substance use and delinquency (Brook, Whiteman, Balka, & Cohen 1997). This study also examined differences in the magnitude of the relations between risk factors with substance use and delinquency; results showed that association with marijuana using peers was more strongly related to substance use than delinquent behaviors, while involvement with deviant peers had a stronger association with delinquency than substance use. In short, research findings with Latino adolescents are consistent with PBT's hypothesized influence of personality (e.g., attitudinal tolerance of deviance) and the perceived environment (peer approval and models of problem behavior) on problem behaviors in this population.

Although negative peer influences have been linked to youth problem behaviors in Latinos, family factors can influence such relations. For example, one study showed that family support moderated the relations between peer substance use (marijuana and tobacco) and adolescent substance use. In other words, as the number of substance using peers increased, higher levels of family support were related with lower levels of youth substance use (Frauenglass et al 1997). Researchers have also highlighted the impact of family conflicts on family relationships (e.g., open parent-youth communications) which in turn can lead to inadequate parental monitoring (see Barerra et al 2001). Inadequate parental monitoring increases the likelihood of youth involvement with devi-

ant peers. Consistent with this suggestion, research with Hispanic, White, and American Indian adolescent boys and girls indicated that inadequate parental monitoring was directly and indirectly (through its effect on adolescents' association with delinquent peers) associated with problem behaviors (Barerra et al 2001).

### Family Relationships

According to scholars, family plays a central role in shaping Latinos' experiences (Carlo, Carranza, & Zambonga 2002; Fuligni, Tseng, & Lam 1999). This value is reflected in familism—the strong identification with, and attachment and loyalty to, one's family, which has also been well-documented among Latinos (e.g., Sabogal, Marin, Otero-Sabogal, Marin, & Perez-Stable 1987; Suarez-Orozco & Suarez-Orozco 1995). The quality of family and peer relationships is an important consideration in youth problem behaviors in Latino populations. While parent influences, particularly parent support and control are relevant aspects of the perceived environment system of PBT, they are considered "distal" structures in the model. Furthermore, the personality system of PBT entails values and expectations placed on independence. Traditional Latino values of familism and cultural emphasis placed on family interdependence and connectedness thus warrants further consideration with respect to health-risk behaviors among Latino youth.

Negative family relationships such as interparental conflict can threaten Latino adolescents' emotional well-being and therefore increase their risk for problem behaviors (see also research on family violence by Caetano, Field, & Nelson 2003 and literature review by Salzinger, Feldman, Stockhammer, & Hood 2002). For example, one study revealed that Latino adolescents who were exposed to parental arguments about them also reported higher levels of substance use (alcohol, tobacco, and marijuana use) and elevated sexual experience (Tschann, Flores, Marin, Pasch, Baisch, & Wibbelsman 2002). Furthermore, Tschann et al (2002) found that adolescents who were more involved in their parents' conflicts (e.g., siding with a parent) also reported higher levels of emotional distress and in turn, experienced higher levels of substance use and had more sexual experience. Hence consistent with prior research with non-Latino adolescents, inter-

parental conflict is associated with negative psychological and behavioral outcomes in Latino adolescents (Tschann et al 2002).

Positive family relationships can help protect Latino adolescents' from becoming involved in problem behaviors. Studies have shown that higher family support, strong family connectedness, and higher parental monitoring is associated with lower alcohol and substance use and less gang involvement among Latinos (e.g., Frauenglass et al 1997; Kerr, Beck, Shattuck, Kattar, & Uriburu 2003). A study with Latino adolescents revealed a significant association between positive family attitudes (i.e., familism) and lower odds for lifetime marijuana use (but only for those who possessed high or moderate knowledge of the drug) (Ramirez, Crano, Quist, Burgoon, Alvaro, & Grandpre 2004). In essence, family relationships can greatly impact Latino adolescents' development and thus warrant important consideration when theorizing about problem behaviors with this population.

### **PROBLEM BEHAVIORS IN LATINOS: SOCIODEMOGRAPHIC AND CULTURAL CONSIDERATIONS**

#### **Socioeconomic Status**

Latinos are overrepresented in the lower socioeconomic sector in the U.S. According to the U.S. Census Bureau (2001b), 22.8 percent of Hispanics were living in poverty in 1999, compared to only 7.7 percent of non-Hispanic Whites. The number of Latino female-headed households is high and when employed, Latino women are likely to work in low-status, low-paying jobs (Padilla & Salgado de Snyder 1995). Such challenges may contribute to parental absence, reduced maternal involvement, and increased family distress. Consistent with this suggestion, research with a nationally representative sample of White, Black, and Hispanic adolescents showed that living in a single-parent home and being Latino were associated with higher levels of involvement in violence, independent of income (e.g., Blum, Beuhring, Shew, Bearinger, Sieving, & Resnik 2000; Smith & Krohn 1995). Although these studies highlight the importance of the family in preventing Latino youth risk-taking, it can be argued that the socioeconomic considerations outlined above are not unique to Latino adolescents, and that a fuller consideration of the impact of economic factors

would broaden the utility of PBT for all ethnically diverse populations.

#### **Immigration and Acculturation**

Another set of factors that must be considered when theorizing about youth risk behaviors in Latinos are those associated with the dynamics of culture adaptation and change. Acculturation<sup>2</sup> is the process of psychological and behavioral adaptation that occurs when two cultures come into contact, as happens when immigrants arrive in a new country or one group is colonized by another (Marin & Marin 1991). Researchers have argued that

[a]cculturation is one of the most important factors that explain risk behavior and health status of Latinos. (Suarez & Ramirez 1999 120)

Research suggests that immigration status and acculturation (commonly assessed through language use or generation status) into U.S. society play a role in youth problem behaviors in Latinos (e.g., Ebin et al 2001; see also De La Rosa 2002, and Epstein, Botvin, & Diaz 2001 for reviews). For example, compared to adolescents with two or more years of U.S. residency, foreign-born Cuban and other Hispanic adolescents who had lived in the U.S. for two years or less had the lowest overall lifetime prevalence rates of substance use (Khoury, Warheit, Zimmerman, Vega, & Gil 1996). In another study, Epstein et al's (2001) large-scale, longitudinal investigation with Latino adolescents revealed that Latino adolescents who spoke English (only or mostly) with their parents reported higher levels of marijuana use than adolescents who Spanish (only or mostly) with their parents. Moreover, one-year follow-up results showed that Latino adolescents who spoke English with their parents engaged in higher levels of polydrug use than those who spoke Spanish with their parents (Epstein et al 2001). Finally students who spoke both English and Spanish with their parents reported higher lifetime polydrug use compared to those who spoke Spanish with their parents (Epstein et al 2001). Although the majority of studies show positive relations between acculturation and substance use, it should be noted that not all studies support the contention that acculturation is associated positively with Latino adolescent

problem behaviors (e.g., Ramirez et al 2004; Zapata & Katims 1994; see De La Rosa 2002, for a review). Thus, it is clear that the association between acculturation and substance use is complex.

The majority of past acculturation and problem behavior research has focused primarily on the direct relation between these two variables (or some other outcome variable) (Dinh et al 2002); hence pathways of mediation or mechanisms that explain the link between acculturation and problem behaviors remain unclear (McQueen, Getz, & Bray 2003). Given the central role of family in Latino culture and the influence of family variables (e.g., parental monitoring and involvement, family relationships) on problem behaviors in Latino youth, the mediating influence of family factors warrants much needed attention (Dinh et al 2002). Indeed, scholars contend that children acculturate faster than their parents (McQueen et al 2003; Padilla & Salgado de Snyder 1995), and highlight Latino parents' concerns regarding their children's acculturation into mainstream American society:

To say that parents do not get concerned about the changing family values would be to ignore a real tension that haunts immigrant parents in particular. During the preschool years, parents are able to exert a strong influence on their children. As children get older, parents fear that they will become too Americanized and forget their language and culture. (Delgado-Gaitan 1993 425)

Parental concerns may give rise to parent-child conflicts, especially if pressures to assimilate outside the home are present. Parent-child acculturation gaps are believed to give rise to problems in family communication and parent-child conflicts (Negy & Woods 1992; Szapocnik, Santisteban, Rio, Perez-Vidal, & Kurtines 1989). Such challenges can disrupt family connectedness which in turn places these youth at high risk for problem behaviors.

Additional empirical evidence has highlighted the mediating role of family and peer relationships with respect to the association between acculturation and problem behaviors. The Samaniego and Gonzales (1999) study revealed that family conflict, low maternal monitoring, inconsistent discipline, and

negative peer hassles mediated the relation between acculturation (as measured by language use and generational status) and delinquency in Mexican American adolescents. In another study, Dinh et al (2002) showed that parental involvement mediated the relation between acculturation and problem behavior proneness a year later.

### Gender

Differential standards and values regarding alcohol use are known to vary by gender among Hispanics. In general, women and children are typically socialized to abstain from drinking (Gilbert & Collins 1997). Flores-Ortiz's (1994) study with Latina adolescents in California noted inherent gender double standards regarding drinking among Mexican American families. The general reported consensus among the Latinas in this study was that Latino cultures condoned drinking among men but not women. Consistent with this suggestion, it is argued that gender can moderate the relation between acculturation and substance use in Latino youth and young adults. Latino youth and young adults acculturate into a U.S. culture that is less prohibitive (compared to traditional Latino cultures) about the use of alcohol by women. As such, Latinas may modify their drinking behavior by adopting more liberal attitudes and behaviors toward drinking. Conversely, Latino youth and young adults who acculturate to the U.S. are therefore less likely to undergo significant changes in their drinking because they are acculturating into a U.S. society where, much like their Latin country of origin, there are no strict cultural sanctions against drinking for males.

Research with Mexican American adolescents highlighted other gender differences with respect to the link between acculturation and problem behaviors (McQueen et al 2003). Their findings revealed that family conflict mediated the association between acculturation (as measured by language) and marijuana use and deviant behavior for males, but not females. Furthermore, generation status was unrelated to problem behaviors, family conflict, and separation for males; however for females, acculturation (as measured by generation status) was indirectly associated with substance use and deviant behaviors through its effect on family conflict and separation.

While prior research has indicated gen-

der differences in adolescent substance use, researchers have argued that gender alone has limited utility in predicting most substance use outcomes in Latino youth (Kulis, Marsiglia, & Hurdle 2003). Research with Mexican American adolescents in the Southwest revealed that gender identity (aggressive masculinity, assertive masculinity, affective femininity, and assertive femininity) was a stronger predictor of substance use than gender alone. In particular, aggressive masculinity was associated with increased risk for substance use, regardless of acculturation level. Findings also revealed that affective femininity and submissive femininity appear to have a protective effect against substance use for Mexican American adolescent boys and girls, particularly among those who are highly acculturated (Kulis et al 2003). Hence in order to make PBT more applicable to Latino adolescents, it is important that gender-identity (not just gender alone per se) and acculturation factors be considered as integral aspects of PBT's conceptual model.

## CONCEPTUAL ISSUES IN CONVENTIONAL BEHAVIORS

### Definitions and Classifications

Jessor and colleagues (1991) define conventional behaviors as behaviors consistent with societal and legal norms as endorsed by social institutions of authority. The most common operational definition is church attendance, although political and health behaviors are included in their conceptual model. These scholars acknowledge that their primary interest is in "prone-ness to behavior system." That is, ultimately, the focus is on the individual's involvement in problem behaviors relative to his or her involvement in conventional behaviors. Therefore, according to PBT scholars, youth who are engaged in problem behaviors are less likely to engage in conventional behaviors. However, this notion does not necessarily hold up conceptually nor when one considers existing empirical literature. Moreover, the emphasis on church attendance as one of the primary markers of conventionality in the behavior structure system presents conceptual and methodological challenges for researchers interested in understanding positive youth development among ethnic minorities.

### Associations Between Problem and Conventional Behaviors in Latinos

According to the behavioral structure system of PBT, there is a direct relation between problem and conventional behavior such that youth can be expected to be more likely to engage in one but not both types of social behaviors. This assumption has implications for theory, methodology, and intervention programs and policy making. First, the assumption implies understanding the development of conventional or problem behaviors will lead to an understanding of the development of both types of behaviors. Second, measures that tap into either set of social behaviors will suffice in our understanding of youth development. And third, the tenet suggests that programs or policy decisions designed to address either the promotion of conventional behaviors or the reduction of problem behaviors will affect both set of behaviors. However, there are concerns that this assumption may oversimplify the challenges of understanding problem and conventional behaviors.

The complexity and challenges of understanding problem behaviors among Latinos can be exemplified by observing behaviors among gang members. Although gang members often exhibit antisocial behaviors, it is also clear that gang members frequently engage in sharing, comforting, protective and supportive behaviors, and even risk their own lives for the good of the group or for others in the group (i.e., altruistic behaviors). Those exhibited behaviors suggest that gang members are capable of prosocial (i.e., behaviors that benefit others) and socially acceptable behaviors; however, prosocial behaviors are often reserved for members of their ingroup and antisocial behaviors are often manifested towards outgroup members (including majority society).

The research evidence that supports the incongruity between antisocial and prosocial behaviors is well-documented. Youth who engage in prosocial behaviors do not automatically engage less in antisocial behaviors and vice versa. Scholars have suggested that children sometimes engage in both prosocial and antisocial behaviors in order to have greater impact on their peer group activities and to gain approval from their peers (Carlo 2006). Furthermore, empirical research on the association between prosocial and antisocial behaviors (such as aggres-

sion) often yields modest correlations (Carlo, Hausmann, Christiansen, & Randall 2003; Crick & Grotpeter 1995; Wyatt & Carlo 2002). There are some youth who engage in high levels of both antisocial and prosocial behaviors and there are other youth who engage in low levels of both sets of behaviors. The research suggests that aggression is not just the flip side of prosocial behaviors or vice versa. Thus, existing developmental research on prosocial and aggressive behaviors suggests that the relations between conventional and problem behaviors will either be nonsignificant or modest at best.

There is additional evidence on the modest and sometimes nonsignificant relations between conventional and problem behaviors. For example, a perusal of the relations between conventional and problem behaviors (a number of measures of substance and alcohol use and deviant behaviors) showed that the correlations ranged from  $-.13$  to  $-.38$  (mean correlation =  $-.24$ ) in a sample of high school students and from  $-.06$  to  $-.24$  (mean correlation =  $-.15$ ) in a sample of college students (Jessor et al 1991; see also Costa, Jessor, Fortenberry, & Donovan 1996). Similarly, in a sample of Latino college students, Zamboanga et al (2004) found modest relations between problem and conventional behaviors. Ebin et al (2001) yielded evidence that adaptive health behaviors were modestly (mostly nonsignificantly) associated with problem behaviors among Latino adolescents. These findings demonstrate a modest overlap between conventional and problem behaviors.

### **Towards a Broader Conception of Conventuality**

Scholars have long noted the overemphasis on negative and risk behaviors by researchers who study ethnic minority populations (Allen & Mitchell 1998; McLoyd 1990). There have been a number of important consequences that stem from this kind of research emphasis. First, researchers have noted the lack of theories that foster our understanding of normative development among those youth. Second, some of the existing research has been characterized as reinforcing or creating deficit models—models that depict ethnic minorities as deficient relative to non-ethnic minority youth. Third, an overemphasis on negative and risky behaviors among ethnic minority populations

may help to reinforce negative stereotypes, racist attitudes, and stigmatization that are already prevalent in sections of our society.

A broader and more comprehensive approach to studying problem behaviors would create opportunities to deepen our understanding of positive behavioral outcomes as well as promote our understanding of variables that could buffer negative symptomatology. Furthermore, studying a broader array of behaviors would provide an ecological valid and more balanced understanding of Latino youth development that acknowledges the strengths and complexity of these individuals. In addition, movement towards more complex models of Latino youth development would help us account for the wide individual differences in social behaviors among Latinos. Thus, there is great importance to understanding positive social development, including conventional behaviors among Latinos.

One major limitation of PBT is the somewhat narrow operational definition of conventional behaviors. Turiel (1983) and his colleagues proposed that behaviors can be divided into several categories depending upon the obligatory nature and the surrounding social norms. Conventional behaviors were defined as actions guided by prevailing informal social norms and customs. Moral behaviors are defined by formal societal laws or rules that have strong socially obligatory characteristics. Actions in the personal domain reflect individual preferences and biases with no grounding in formal societal rules or laws. Finally, prudential actions are those behaviors that subscribe to considerations of the child's safety or well-being. An additional set of behaviors is prosocial behaviors (i.e., behaviors intended to benefit others). Those latter behaviors can fit under the rubric of either conventional or moral domains (Carlo 2006). The strength of this typology is that conventional behaviors are not simply considered as a unidimensional construct. Instead, behaviors are classified accordingly to reflect the social contextual circumstances, the underlying intentions, and the consequences.

In an attempt to broaden their focus to additional conventional behaviors, Jessor, Turbin, and Costa (1998) examined the associations between several conventional-related variables (e.g., school and parent orientation, positive relations with adults, friends

as models for conventional behaviors, prosocial activities, and church attendance) and health-related risk factors (e.g., stress, peer pressure susceptibility, parents smoking behaviors) and health enhancing behaviors (e.g., seat belt use, good dental hygiene, sleep, exercise). The researchers demonstrated that conventionality-related behaviors were positively related to health-enhancing behaviors.

Although the aforementioned study is one of the first to directly examine positive traits and behaviors from a PBT perspective, there are several issues worth noting. First, church attendance was included as a predictor rather than a criterion variable as part of the behavioral system as proposed by PBT. Second, the conceptualization of the study design was somewhat ambiguous because the conventionality-related variables were conceptualized as protective factors but scholars have noted that protective factors are variables that protect against negative symptomatology under adverse conditions (e.g., Masten & Reed 2002). The adverse conditions of the sample in the study were not established—thus, the operationalization of protective factors is subject to question. And third, although the study of protective and buffer factors is important in its own right, understanding the development of conventional behaviors requires that conventional behaviors are the focus outcome of research. Thus, there is a need to carefully distinguish between the different system levels of the structure of PBT and to consider the broad array of behaviors that fall under the rubric of conventional behaviors. The importance of these issues becomes more evident when we attempt to understand the development of conventional behaviors among Latino youth.

#### **CONVENTIONAL BEHAVIORS IN LATINOS: SOCIAL CONSIDERATIONS**

##### **Peer Influences**

Although there is a substantial body of evidence suggesting that peers influence the development of prosocial behaviors (see Carlo, Fabes, Laible, & Kupanoff 1999), research on the influence of peers on prosocial and conventional behaviors among Latinos is nonexistent to our knowledge. However, as peers become more influential with age, one might expect that peers serve as models for prosocial and conventional behaviors.

Furthermore, peers provide direct and indirect social feedback (social rewards and punishers) on prosocial and conventional behaviors. Moreover, because youth constantly engage in social comparisons, peers can influence youth by providing standards and norms for social behaviors (Carlo et al 1999). The influence of peers is likely to be exacerbated or mitigated by the degree of perceived similarity or admiration for the peer or peer group.

One specific dimension along which the strength of the influence of peers might vary among Latino youth is ethnic identity. Latino youth might be more susceptible to peer influence to the degree that the youth identifies with their culture of origin and the peer group reflects the strength of that ethnic identity. Peer groups that exhibit behaviors or cultural pride that reflect closely the youth's ethnic identity may be more apt to their influence and vice versa. Furthermore, the influence of peers may also depend on the congruency between the youth's ethnic identity and his or her parents' ethnic identity. The greater the disparity, the greater the distance between parents and their youth, and in turn, this might lead to greater impact by the peer group. Although some research has been conducted on peer influence in Latino gang affiliation, research on the influence of peers on Latino youth normative development is lacking. Further research is needed to examine these processes among normative groups of Latinos.

##### **Family Relationships**

In contrast to the lack of research on the influence of peers on positive Latino youth development, there is a body of research on the influence of family on positive Latino youth development. Conceptually, parents and family members are expected to impact Latino children's development, particularly early in life. By adolescence, youth renegotiate their relationships with their parents and family members and become increasingly influenced by peers (Youniss 1980).

However, as mentioned previously, scholars have noted that close family relationships are the hallmark of many Latino families and that most Latino families foster familial interdependence (e.g., Knight, Bernal, & Carlo 1995; Raffaelli, Carlo, Carranza, & Gonzalez-Kruger Forthcoming). Furthermore, studies suggest that parents may still be influential

even in adolescence (Carlo et al 1999) and this might be particularly true among some Latinos. For example, there is some research that shows that Latinas (relative to Latinos) remain closely monitored by their parents and maintain close relationships with their parents (see Carlo et al 1999). Recently, de Guzman and Carlo (2004) showed that family adaptability was associated positively with prosocial behaviors in a sample of Latino adolescents. The finding suggests that, among Latinos, families who are flexible in responding to the youth's specific circumstances may be more adept at fostering prosocial behaviors. Given the potential challenges posed by intergenerational and intercultural value conflicts, family adaptability may become a more pressing characteristic to foster positive behavioral outcomes.

#### **CONVENTIONAL BEHAVIORS IN LATINOS: SOCIODEMOGRAPHIC AND CULTURAL CONSIDERATIONS**

##### **Socioeconomic Status**

Researchers have shown links between family economic status and maladjustment in children and adolescents (e.g., Elder & Conger 2000). According to those scholars, economic strain on the family fosters parental depression, which in turn, impedes effective parenting and leads to negative symptomatology in children. However, to our knowledge, no research has been conducted to examine whether there is a similar mechanism that impacts prosocial or conventional behaviors. Research examining the potential impact of economic strain on prosocial and conventional behaviors among Latinos is therefore needed.

There is another mechanism that would imply a strong association between SES and prosocial and conventional behaviors, especially among Latinos. As new Latinos enter the U.S., many immigrants acculturate to the majority society. However, acculturation often induces acculturative stress (i.e., taxing demands that result from adapting to the new majority society). Thus, in addition to possible economic strain from low starting household income, Latino families might experience stress resulting from discrimination, prejudice, or harassment experiences. Therefore, for new immigrants, there might be strong correlations between SES, acculturation, and acculturative stress. Any negative consequences that result from accul-

turative stress might have detrimental impact on prosocial and conventional behaviors in Latino youth. One might discover strong associations between SES and prosocial and conventional behaviors as a result of the strong association between acculturative stress and prosocial and conventional behaviors and the association between SES and acculturation.

Consistent with expectations, there is evidence that more acculturated Latinos are less cooperative and prosocial and less acculturated individuals are more competitive (de Guzman & Carlo 2004; Knight & Kagan 1977). However, to our knowledge, there is no research that examines associations among acculturative stress, SES, and prosocial and conventional behaviors. Clearly, more research is needed to examine those possibilities.

##### **Gender**

According to gender socialization theorists (Gilligan 1982; Maccoby & Jacklin 1974), girls are socialized differently than boys and this has important implications for the development of conventional and prosocial behaviors. For example, girls are encouraged to express sadness more than boys, which is associated with prosocial responding. Furthermore, in many societies, girls are assigned to caring and nurturing responsibilities and expected to fulfill those duties more than boys (see Carlo et al 1999). Indeed, prosocial and conventional behaviors (e.g., comforting, caring) are perceived as more consistent with girls' gender role than boys' gender role (Eisenberg & Fabes 1998). Particularly among Latino families, gender typed expectations are strong. Although there is little or no research that focuses on Latinos, scholars have noted that Latinas are probably more strongly encouraged to fulfill family and household responsibilities (including caring and nurturing siblings) than boys (Knight et al 1995). Other scholars have noted parental expectations for Latino boys to express strong masculine-typed traits and behaviors. Taken together, those practices and expectations foster greater likelihood of prosocial and conventional behaviors in Latino girls rather than Latino boys.

There is considerable empirical evidence that girls exhibit higher levels of prosocial behaviors than boys, especially during adolescence (e.g., Carlo 2006). During late ado-

lescence and young adulthood, however, scholars have found that boys do express higher levels of instrumental and risky prosocial behaviors than girls; whereas, girls express higher levels of nurturing and caring prosocial behaviors than boys (Eagly & Crowley 1986). Unfortunately, to our knowledge, studies that directly examine gender differences in prosocial and conventional behaviors among Latino youth are lacking.

### SUMMARY AND CONCLUSIONS

Taken together, research on problem and conventional behaviors among Latino samples suggest a more differentiated behavior system than that which is proposed by PBT scholars. The conceptual and methodological limitations of PBT highlighted in this paper have important implications for the development of valid measurement tools. The existing research suggests that further assessment of the psychometric properties of measures to use with Latinos is necessary. These issues, if not properly addressed, could create stigmatization and rejection towards Latinos if inadequate measures present Latinos as problematic or "prone" to problem behaviors. Finally, the study of problem and conventional behaviors in Latinos requires careful consideration of peer, family, sociodemographic, gender, and culture-relevant (e.g., acculturation, ethnic identity) variables. Although such research increases the complexity of existing theory and methodology, the resulting empirical research will more adequately reflect the multidimensional nature of Latino youth development.

### ENDNOTES

- 1 The term "Latino/a" are used in this paper to refer to persons of Mexican, Puerto Rican, Cuban, or other Central and South American, and/or other Spanish origin with the understanding that there are cultural differences between Latino subgroups. We also used the terms Latino and Hispanic interchangeably in the text of the manuscript.
- 2 Scholars have debated the complexities surrounding acculturation as well as appropriate ways to measure it (e.g., language use, generation status, ethnic identity, ethnic loyalty and awareness) in Latino populations. The theoretical significance surrounding these measurement debates cannot be overemphasized, but because they are beyond the scope of this paper, readers are directed to other sources (e.g., Berry 2002; Negy & Woods 1992) for in-depth information about acculturation.

### REFERENCES

- Allen L & C Mitchell. 1998. Racial and ethnic differences in patterns of problematic and adaptive development: an epidemiological review. Pp. 29-54 in *Studying Minority Adolescents: Conceptual, Methodological, and Theoretical Issues*. V McLoyd & L Steinberg, eds. Mahwah, NJ: Lawrence Erlbaum Associates.
- Barrera M, A Biglan, D Ary, & F Li. 2001. Replication of problem behavior model with American Indian, Hispanic, and Caucasian youth. *J Early Adolescence* 21 133-157.
- Berry JW. 2002. Conceptual approaches to understanding acculturation. Pp. 17-37 in *Acculturation: Advances in Theory, Measurement, and Applied Research*. KM Chun, PB Organista, & G Marin, eds. Washington, DC: American Psychological Association.
- Blum RW, T Beuhring, ML Shew, LH Bearinger, RE Sieving, & MD Resnik. 2000. The effects of race/ethnicity, income, and family structure on adolescent risk behaviors. *Amer J Public Health* 90 462-468.
- Brook JS, M Whiteman, EB Balka, & P Cohen. 1997. Drug use and delinquency: Shared and unshared risk factors in African American and Puerto Rican adolescents. *J Genetic Psychology* 158 25-39.
- Caetano R, CA Field, & S Nelson. 2003. Association between childhood physical abuse, exposure to parental violence, and alcohol problems in adulthood. *J Interpersonal Violence* 18 240-257.
- Carlo G. 2006. Care-based and altruistically-based morality. Pp. 551-579 in *Handbook of Moral Development*. M Killen & JG Smetana, eds. Mahwah, NJ: Lawrence Erlbaum Associates.
- Carlo G, MA Carranza, & BL Zamboanga. 2002. Culture, ecology, and Latinos on the Great Plains: an introduction. *Great Plains Res J Natural & Soc Sci* 12 3-12.
- Carlo G, RA Fabes, DJ Laible, & K Kupanoff. 1999. Early adolescence and prosocial/moral behavior II: the role of social and contextual influences. *J Early Adolescence* 19 133-147.
- Carlo G, A Hausmann, S Christiansen, & BA Randall. 2003. Sociocognitive and behavioral correlates of a measure of prosocial tendencies for adolescents. *J Early Adolescence* 23 107-134.
- Center for Disease Control. 1997. Youth risk behavior surveillance: national college health risk behavior survey-United States, 1995. *MMWR* 46 (SS-6).
- \_\_\_\_\_. 2002. Youth risk behavior surveillance-United States, 2001. *MMWR* 51 (SS-4).
- Costa FM, R Jessor, JD Fortenberry, & JE Donovan. 1996. Psychological conventionality, health orientation, and contraceptive use in adolescence. *J Adolescent Health* 18 404-416.
- Crick NR & JK Grotpeter. 1995. Relational aggression, gender, and social-psychological adjustment. *Child Development* 66 710-722.

- de Guzman MRT & G Carlo. 2004. Family, peer, and acculturative correlates of prosocial development among Latino youth in Nebraska. *Great Plains Res J Natural & Soc Sci* 14 185-202.
- De La Rosa M. 2002. Acculturation and Latino adolescents' substance use: a research agenda for the future. *Substance Use Misuse* 37 429-456.
- Delgado-Gaitan C. 1993. Parenting in two generations of Mexican American families. *Internat J Behavioral Develop* 16 409-427.
- Dinh KT, MW Roosa, JY Tein, & VA Lopez. 2002. The relationship between acculturation and problem behavior proneness in a Hispanic youth sample: a longitudinal mediation model. *J Abnormal Child Psychol* 30 295-309.
- Eagly AH & M Crowley. 1986. Gender and helping behavior: a meta-analytic review of the social psychological literature. *Psychological Bull* 100 283-308.
- Ebin VJ, CD Sneed, DE Morisky, MJ Rotheram-Borus, AM Magnusson, & CK Malotte. 2001. Acculturation and interrelationships between problem and health-promoting behavior among Latino adolescents. *J Adolescent Health* 28 62-72.
- Eisenberg N & RA Fabes. 1998. Prosocial development. Pp. 701-778 in *Handbook of Child Psychology, Vol. 3: Social, Emotional, and Personality Development*. 5th ed. W Damon (series ed.) & N Eisenberg (vol. ed.). NY: John Wiley.
- Elder GH, Jr, & RD Conger. 2000. *Children of the Land: Adversity and Success in Rural America*. Chicago, IL: U Chicago Press.
- Epstein JA, GJ Botvin, & T Diaz. 2001. Linguistic acculturation associated with higher marijuana and polydrug use among Hispanic adolescents. *Substance Use Misuse* 36 477-499.
- Flores-Ortiz YG. 1994. The role of cultural and gender values in alcohol use patterns among Chicana/Latina high school and university students: implications for AIDS prevention. *Internat J Addictions* 29 1149-1171.
- Frauenglass S, DK Routh, HM Pantin, & CA Mason. 1997. Family support decreases influence of deviant peers on Hispanic adolescents' substance use. *J Clinical Child Psychol* 26 15-23.
- Fulgini AJ, V Tseng, & M Lam. 1999. Attitudes toward family obligations among American adolescents with Asian, Latino American, and European backgrounds. *Child Development* 70 1030-1044.
- Gilbert JM & RL Collins. 1997. Ethnic variation in women's and men's drinking. Pp. 357-378 in *Gender and Alcohol: Individual and Social Perspectives*. RW Wilsnack & SC Wilsnack, eds. New Brunswick, NJ: Rutgers Center of Alcohol Studies.
- Gilligan C. 1982. *In a Different Voice: Psychological Theory and Women's Development*. Cambridge, MA: Harvard U Press.
- Hawkins JD, RF Catalano, & JY Miller. 1992. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological Bull* 112 64-105.
- Jessor R. 1987. Problem-behavior theory, psychosocial development, and adolescent problem drinking. *Brit J Addiction* 82 331-342.
- Jessor R, JE Donovan, & FM Costa. 1991. *Beyond Adolescence: Problem Behavior and Young Adult Development*. Cambridge, England: Cambridge U Press.
- Jessor R & S Jessor. 1977. *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. NY: Academic Press.
- Jessor R, MS Turbin, & FM Costa. 1998. Protective factors in adolescent health behavior. *J Personality Soc Psychol* 75 788-800.
- Kerr MH, K Beck, TD Shattuck, C Kattar, & D Uriburu. 2003. Family involvement, problem and prosocial behavior outcomes of Latino youth. *Amer J Health Behavior* 27 55-65.
- Khoury EL, GJ Warheit, RS Zimmerman, WA Vega, & AG Gil. 1996. Gender and ethnic differences in the prevalence of alcohol, cigarette, and illicit drug use over time in a cohort of young Hispanic adolescents in South Florida. *Women and Health* 24 21-40.
- Knight G, M Bernal, & G Carlo. 1995. Socialization and the development of cooperative, competitive, and individualistic behaviors among Mexican American children. Pp. 85-102 in *Meeting the Challenge of Linguistic and Cultural Diversity in Early Childhood Education, Vol. 6: Yearbook in Early Childhood Education*. EE Garcia & BM McLaughlin, eds. NY: Teachers College Press.
- Knight GP & S Kagan. 1977. Acculturation of prosocial and competitive behaviors among second- and third-generation Mexican-American children. *J Cross-Cultural Psychol* 8 273-284.
- Kulis S, FF Marsiglia, & D Hurdle. 2003. Gender identity, ethnicity, acculturation, and drug use: exploring differences among adolescents in the Southwest. *J Community Psychol* 31 167-188.
- Maccoby EE & CN Jacklin. 1974. *The Psychology of Sex Differences*. Stanford, CA: Stanford U Press.
- Marin G & BV Marin. 1991. *Research with Hispanic Populations*. Newbury Park: Sage.
- Masten A & MJ Reed. 2002. Resilience in development. Pp. 74-88 in *Handbook of Positive Psychology*. CR Snyder & S Lopez, eds. London: Oxford U Press.
- McLoyd VC. 1990. Minority children: introduction to the special issue. *Child Development* 61 263-266.
- McQueen A, JG Getz, & JH Bray. 2003. Acculturation, substance abuse, and deviant behavior: examining separation and family conflict as

- mediators. *Child Development* 74 1737-1750.
- Mitchell CM & J Beals. 1997. The structure of problem and positive behavior among American Indian adolescents: gender and community differences. *Amer J Community Psychol* 25 257-288.
- Negy C & DJ Woods. 1992. The importance of acculturation in understanding research with Hispanic-Americans. *Hispanic J Behavioral Sci* 14 224-247.
- Newcomb MD. 1995. Drug use etiology among ethnic minority adolescents: risk and protective factors. Pp. 105-129 in *Drug Abuse Prevention with Multiethnic Youth*. GJ Botvin, S Schinke, & MA Orlandi, eds. Thousand Oaks, CA: Sage.
- Padilla AM & VN Salgado de Snyder. 1995. Hispanics: what the culturally informed evaluator needs to know. Pp. 117-146 in *Cultural Competence for Evaluators: A Guide for Alcohol and Other Drug Abuse Prevention Practitioners Working With Ethnic/Racial Communities*. MA Orlandi, ed. Rockville, MD: US Department of Health and Human Services.
- Raffaelli M, G Carlo, M Carranza, & G Gonzalez-Kruger. Forthcoming. Understanding Latino children and adolescents in the mainstream: putting culture at the center of developmental models. In *New Directions for Child and Adolescent Development*. R Larson & L Jensen, eds.
- Raffaelli M, BL Zamboanga, & G Carlo. 2005. Acculturation status and sexuality among Cuban-American college students. *J Amer College Health* 54 7-13.
- Ramirez JR, WD Crano, R Quist, M Burgoon, EM Alvaro, & J Grandpre. 2004. Acculturation, familism, parental monitoring, and knowledge as predictors of marijuana and inhalant use in adolescents. *Psychol Addictive Behaviors* 18 3-11.
- Sabogal F, G Marin, R Otero-Sabogal, BV Marin, & EJ Perez-Stable. 1987. Hispanic familism and acculturation: what changes and what doesn't? *Hispanic J Behavioral Sci* 9 397-412.
- Salzinger S, RS Feldman, T Stockhammer, & J Hood. 2002. An ecological framework for understanding risk for exposure to community violence and the effects of exposure on children and adolescents. *Aggression & Violent Behavior* 7 423-451.
- Samaniego RY & NA Gonzales. 1999. Multiple mediators of the effects of acculturation status on delinquency for Mexican American adolescents. *Amer J Community Psychol* 27 189-209.
- Smith C & MD Krohn. 1995. Delinquency and family life among male adolescents: the role of ethnicity. *J Youth Adolescence* 24 69-93.
- Suarez L & AG Ramirez. 1999. Pp. 115-136 in *Promoting Health in Multicultural Populations: A Handbook for Practitioners*. RM Huffer & MV Kline, eds. Texas Department of Health.
- Suarez-Orozco C & M Suarez-Orozco. 1995. *Transformations: Immigration, Family Life, and Achievement Motivation Among Latino Youths*. Stanford, CA: Stanford U Press.
- Szapocnik J, D Santisteban, A Rio, A Perez-Vidal, & WM Kurtines. 1989. Family effectiveness training: an intervention to prevent drug abuse and problem behaviors in Hispanic adolescents. *Hispanic J Behavioral Sci* 11 4-27.
- Tschann JM, E Flores, BV Marin, LA Pasch, EM Baisch, & CJ Wibelmsman. 2002. Interparental conflict and risk behaviors among Mexican American adolescents: a cognitive-emotional model. *J Abnormal Child Psychol* 30 373-385.
- Turiel E. 1983. *The Development of Social Knowledge: Morality and Convention*. Cambridge, England: Cambridge U Press.
- U.S. Census Bureau. 2001a. *The Hispanic Population: 2000*. Washington, DC: USGPO.
- \_\_\_\_\_. 2001b. *The Hispanic Population in the United States: March 2000, Current Population Reports, P20-535*. Washington, DC: USGPO.
- U.S. Department of Health and Human Services. 2001. *Mental Health: Culture, Race and Ethnicity – Supplement to Mental Health: A Report of the Surgeon General*. Rockville, MD.
- Williams JH, CD Ayers, RD Abbott, JD Hawkins, & RF Catalano. 1996. Structural equivalence of involvement in problem behavior by adolescents across racial groups using multiple group confirmatory factor analysis. *Social Work Res* 20 168-177.
- Wyatt JM & G Carlo. 2002. What will my parents think? Relations among adolescents' expected parental reactions, prosocial moral reasoning, and prosocial and antisocial behaviors. *J Adolescent Res* 17 646-666.
- Youniss J. 1980. *Parent and Peers in Social Development: A Sullivan-Piaget Perspective*. Chicago: U Chicago Press.
- Zamboanga BL, G Carlo, & M Raffaelli. 2004. Problem behavior theory: an examination of the behavior structure system in Latino and non-Latino college students. *Interamer J Psychol* 38 253-262.
- Zapata JT & DS Katims. 1994. Antecedents of substance use among Mexican American school-age children. *J Drug Education* 24 233-251.

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